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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary**Application No.**

10/564,294

Applicant(s)DE VAAN, ADRIANUS JOHANNES
STEPHANES MA**Examiner**

LEAH S. LOVELL

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 October 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claim 1, 11, and 15 are rejected under 35 U.S.C. 102(e) as being anticipated by Sakata et al. (US 7,192,147).

Regarding claim 1, Sakata discloses an illumination system comprising a light guide [see figure A below for details of the light guide] having an entrance face, an exit face and an aperture in which a light source [14R, 14G, 14B] can be arranged [figure 1], the system being characterized in that it comprises:

a light reflective structure [15] arranged in proximity to the light guide entrance face [figure 1], the light reflective structure [15] being arranged with an aperture in which the light source can be fitted [figure 1]; and

a first light refractive structure [see figure A below] arranged in proximity to the light guide exit face [figure A below], in which first light refractive structure:

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at least a subset of light beams of a first angular interval with respect to the optical axis of the system is refracted to illuminate the light guide exit face [the light refractive structure includes a reflective polarizer, which inherently meets this limitation], and

at least a subset of light beams of a second angular interval with respect to said optical axis is reflected to be recycled in the light guide [the light refractive structure includes a reflective polarizer, which inherently meets this limitation].

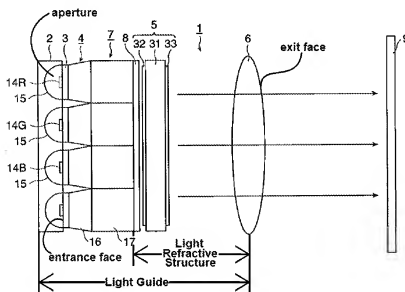


FIGURE A: Figure 1 of Sakata modified to indicate a portion of the limitations of claim 1.

Regarding claim 11, Sakata discloses a projection display system comprising the illumination system of claim 1 [abstract].

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Regarding claim 15, Sakata discloses the entrance face [indicated in figure A above] and exit face [indicated in figure A above] of the light guide are opposite to and in parallel with each other [figure A above].

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-5, 7-10, and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jagt et al. (US 7,265,800), in view of Miyazaki (US 6,065,845).

Regarding claim 1, Jagt discloses an illumination system comprising a light guide [101, 102, 103] having an entrance face [the face of the light guide where the light source (120) resides], an exit face [at surface 109] the system being characterized in that it comprises:

a light reflective structure [104,105] arranged in proximity to the light guide entrance face [figure 1, the light reflective structure is shown near to the light guide entrance face, which is the face of the light guide where the light source (120) resides], the light reflective structure [104, 105] being arranged with an aperture in which the light source can be fitted [since the light reflective face extends over two surfaces, thereby leaving two surfaces devoid of the reflective face, these two surfaces

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without the light reflective surface provide an opening, i.e. aperture, for the light source; shown in figure 1]; and

a first light refractive structure [103, 109] arranged in proximity to the light guide exit face, in which first light refractive structure:

at least a subset of light beams [132] of a first angular interval with respect to the optical axis of the system is refracted to illuminate the light guide exit face [figure 1; the optical axis is defined as the axis extending out of the system towards the viewer, as is standard in liquid crystal devices], and

at least a subset of light beams [133] of a second angular interval with respect to said optical axis is reflected to be recycled in the light guide [figure 1].

Jagt discloses the claimed invention as indicated above and further indicates that a non-descript light source [120] provides the illumination. However, Jagt does not disclose an aperture in which a light source can be arranged. Miyazaki teaches the light entrance face of the light guide [16] having recesses to receive LED [18, 18a] [figure 3 clearly shows apertures in which the LEDs are received]. The apertures in the light guide, like those of Miyazaki, allows for minimal light loss between the light source and the light guide, since the LED almost completely surrounded by either the light guide plate or reflectors to reflect light toward the light guide plate. It is also well known within the art to illuminate a backlight using many different light sources; for example: a fluorescent tube abutted against a flat light entrance face, LED(s) combined with a light

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guiding bar abutted against a flat light entrance face, or LED(s) which are either flat against the light entrance face or the light entrance face has recesses to receive the LEDs to eliminate light loss to name a few. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to apply the apertures for receiving the light sources as taught in Miyazaki, to improve the liquid crystal display of Jagt for the predictable result of a brighter light emission from the system due to the prevention of light loss. *KSR International Co. v. Teleflex Inc.*, 82 USPQ2d 1385 (2007).

In regard to claim 2, Jagt discloses a light diffusing element [column 3, lines 60-67] arranged between the light reflective structure [104, 105] and the first light refractive structure [103, 109] to alter the angle of light beams incident on said diffusing element with respect to the optical axis [the diffusive element would inherently be positioned between the reflector and the light refractive structure, since there are two arrangements of the diffusive reflective plates (104, 105): the diffusive element on bottom or the diffusive element on top. If the diffusive element were positioned on the bottom of the light reflective plate, it wouldn't alter any light since it would all be reflected by the light reflecting surface on top. Therefore, the diffusive element has to be on top of the reflective surface, which positioned the diffusive element between the reflector and refractor].

Regarding claim 3, Jagt discloses a reflective polarizer [102] arranged in proximity to the light guide exit face to transmit light beams of a first polarization mode and reflect light beam of a second polarization mode [proximity is shown in figure 1; column 5, lines 28-46].

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In regard to claim 4, Jagt discloses a polarization converting element [102; column 5, lines 28-46] arranged in the light guide to alter the polarization mode of light beams incident on said polarization converting element [column 5, lines 28-46; figure 1].

Regarding claim 5, Jagt discloses a second light refracting structure [102] arranged in proximity to the light guide entrance face to increase the angle of light beams refracted in said second light refracting structure with respect to the optical axis [figure 1].

Regarding claim 7, Miyazaki discloses the light source as a LED [abstract].

In regard to claims 8 and 9, Jagt, as modified by Miyazaki, does not directly disclose the use of a laser or gas discharge lamp, it is simply stated that a "light source" is employed in the device. It is well known in the art that both a laser and a gas discharge lamp satisfy the requirement of being a light source that is commonly used in liquid crystal devices. It would have been obvious to one of ordinary skill in the art at the time of the invention to use either a laser or gas discharge lamp in place of the LED disclosed by Jagt, as modified by Miyazaki. One would be motivated to do so based on the availability of point sources at the time of manufacture since both would not compromise the integrity of the invention.

Regarding claim 10, Jagt discloses a display system [100, 103, 102, 101, 104, 105, 120] comprising the illumination system in claim 1 [figure 1].

Regarding claim 12, Jagt discloses a direct view LCD system [100, 103, 102, 101, 104, 105, 120] comprising the illumination system of claim 1 [figure 1].

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In regard to claim 13, Jagt discloses the optical axis of the system [Z illustrates the optical axis] is normal to light guide exit face [figures 2a and 2b], and wherein the subset of light beams of the first angular interval that are refracted by the first light refractive structure to illuminate the light guide exit face make an angle with respect to the optical axis that is greater than an angle with respect to the optical axis that is made by the subset of light beams of the second angular interval that is reflected to be recycled in the light guide [see figure B below].

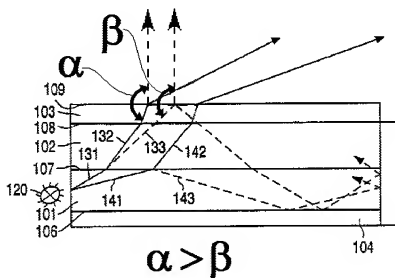


FIGURE B: Modified figure 1 of Jagt to clearly indicate the angle, in relation to the optical axis, of the first subset of light is larger than that of the second subset of light.

In regard to claim 14, Jagt discloses the first light refractive structure [103] comprises a plurality of prisms [figures 2a and 2b].

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5. Claims 6 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jagt et al. (US 7,265,800) and Miyazaki (US 6,065,845) as applied to claim 1 above, and further in view of Yokoyama (US 6,547,400).

In regard to claims 6 and 11, Jagt, as modified by Miyazaki, disclose the claimed invention as indicated above. Jagt, as modified by Miyazaki, also discloses a plurality of apertures for a plurality of light sources, however, Jagt, as modified by Miyazaki, does not disclose dichroic coatings for each light source. Yokoyama discloses a similar device in that there is a light guide [41] having a plurality of light sources [100] optically connected to an LCD arrangement [30]. In figure 5 of Yokoyama, it is depicted that the individual light sources [100] are each colored to red, green, and blue. In the quarter of the light guide [41] not having an adjacent light source arrangement, the three colors combine to create one multi-colored image, which is then projected onto a screen. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the dichroic filters of Yokoyama in the arrangement of Jagt, as modified by Miyazaki, along with multicolored LEDs. One would be motivated to do so because Yokoyama teaches that the three colors successfully combine to create one sharp, bright image. It also would have been obvious to one of ordinary skill in the art at the time of the invention to use the light guides of Jagt, as modified by Miyazaki, in a projector system, like that of Yokoyama. One would have been motivated to do so because Yokoyama discloses that liquid crystal displays can be successfully utilized as projection devices. Also projection systems are highly desirable in the art to project larger images without the confines of a traditional LCD screen.

Response to Arguments

6. Regarding the objections to the specification in the office action dated 25 July 2007, while the objections have been withdrawn, the Examiner would like to respectfully ask the Applicant to reconsider correcting at least the specification objections because the corrections would assist others when reading through the scope to quickly and easily find desired features.
7. Applicant's arguments with respect to claims 1-12 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:
- Parker et al. (US 5,618,096) is cited as having a light guide with apertures to receive light sources and a reflective surface in proximity to the light entrance face of the light guide plate.
 - DeCaro et al. (US 6,191,872) is cited as an illumination system having an entrance face and exit face of a light guide opposite to each other.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LEAH S. LOVELL whose telephone number is (571)272-2719. The examiner can normally be reached on Monday through Friday 8 a.m. until 4:30 p.m.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jong-Suk (James) Lee can be reached on (571) 272-7044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Leah Lovell
Examiner
11 January 2008

/Jong-Suk (James) Lee/
Supervisory Patent Examiner, Art Unit 2885